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REMARKS

Claims 1-4, 7, 9, 11-15, 18 and 20 are pending in this application. By this amendment, Applicants amend claims 1 and 11 and cancel claims 5, 6, 8, 10, 16, 17, 19 and 21.

Claims 1-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kuroda et al. (U.S. 6,215,229), Wajima et al. (U.S. 6,274,968) or Sugiyama et al. (U.S. 6,160,462) in view of Tsuji et al. (U.S. 5,699,027) or Onishi et al. (U.S. 5,459,368). Applicants respectfully traverse this rejection.

Claim 1 has been amended to recite:

"A piezoelectric resonator comprising:
a piezoelectric resonating element; and
a first exterior substrate and a second exterior substrate laminated over and under, respectively, on said piezoelectric resonating element; wherein each of said first exterior substrate and said second exterior substrate includes a multilayer substrate having at least one layer of an internal electrode; and

said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer."
(Emphasis added)

Claim 11 recites features that are similar to claim 1, including the emphasized features.

The present claimed invention includes the first exterior substrate and the second exterior substrate each including "a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer". As a result, shrinkage of the first substrate material layer due to sintering is prevented by the second substrate material layer which is not sintered, and shrinkage in a surface parallel to a primary surface of the multilayer substrate due to sintering is prevented. Therefore, the dimensional accuracy of the multilayer substrate is greatly improved (see, for example, the first paragraph on page 27 of the present application).

The Examiner alleged that Kuroda, Wajima and Sugiyama teach all of the features of the piezoelectric resonator recited in claims 1-21 except for laminated

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substrates including integral capacitors. However, the Examiner alleges that Tsuji and Onishi teach mounting piezoelectric resonators on substrates provided as laminated layers incorporating circuit elements in an integral construction, and thus concludes that to provide a very compact self contained piezoelectric resonator as shown by Tsuji or Onishi it would have been obvious to one of ordinary skill in the art to use laminated substrates with Kuroda, Wajima or Sugiyama. Applicants respectfully disagree.

However, in contrast to the present claimed invention, each layer of the laminated multilayer substrates of Tsuji and Onishi is made of the exact same material. Particularly, col. 7, lines 58-62 of Tsuji discloses that the "multilayer substrate 1 comprises dielectric layers 2, 3 made of low temperature baking material that can be baked at 1000°C or less", and col. 5, lines 37-38 of Onishi discloses that "an alumina-glass ceramic was used as a dielectric for multilayer substrate 8."

Thus, Tsuji and Onishi clearly fail to teach or suggest a multilayer substrate including a first substrate material layer and a second substrate material layer, and certainly fail to teach or suggest "a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer" as recited in claims 1 and 11 of the present application.

As acknowledged by the Examiner, Kuroda, Wajima and Sugiyama fail to teach or suggest any multilayer substrate, and thus, clearly fails to teach or suggest first and second multilayer exterior substrates including "a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer" as recited in claims 1 and 11 of the present application.

Accordingly, Applicants respectfully submit that Kuroda, Wajima, Sugiyama, Onishi and Tsuji, taken individually or in combination, fail to teach or suggest the unique combination and arrangement of elements recited in claims 1 and 11 of the present application.

In view of the foregoing remarks, Applicants respectfully submit that claims 1 and 11 are allowable. Claims 2-4, 7, 9, 12-15, 18 and 20 depend upon claims 1 and 11, and

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are therefore allowable for at least the reasons that claims 1 and 11 are allowable.

In view of the foregoing Remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance are respectfully solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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VERSION WITH MARKINGS SHOWING CHANGES MADE

1. A piezoelectric resonator comprising:
 - a piezoelectric resonating element; and
 - a first exterior substrate and a second exterior substrate laminated over and under, respectively, on said piezoelectric resonating element;

wherein each of said first exterior substrate and said second exterior substrate includes a multilayer substrate having at least one layer of an internal electrode; and
said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.

11. A piezoelectric oscillator comprising:
 - a built-in load capacitance type piezoelectric oscillator including:
 - a piezoelectric resonating element; and
 - a first exterior substrate and a second exterior substrate, which are laminated over and under, respectively, said piezoelectric resonating element, and which constitutes a three-terminal capacitor connected to said piezoelectric resonating element; wherein
 - said first exterior substrate and said second exterior substrate each includes a multilayer substrate having at least one layer of an internal electrode; and
said first exterior substrate and said second exterior substrate each includes a first substrate material layer which is liquid-sintered and a second substrate material layer which is not sintered at the sintering temperature of said first substrate material layer.